



Visual Imagery on State Anxiety, learning and Cognitive style among Higher Secondary School Students

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Abstract

*This study provided essential information; about the effect of visual imagery improved the learning style and cognitive style of the students. Visual imagery is reported to play a central role in stress disorder... This investigation examined visual imagery ability in students with varying degrees of state anxiety and different cognitive styles. **Methods** A sample comprising 100 higher secondary students were chosen for the study. Before finalizing the final form of the tools and collecting data for the main study, a pilot study was attempted by giving learning style questionnaire to 200 students. From this 50 students with visual learning style were picked up and given 4 weeks training of Visual imagery. After that their state anxiety and cognitive style scores were taken and the data were analyzed and interpreted. **Conclusions:** 1. There was a significant impact on state anxiety and intuitive cognitive style scores. 2. Visual learning style scores were significantly improved after the training. 3. There was a significant relationship between visual leaning style with intuitive cognitive style*

Key Words: Visual Imagery, Cognitive Style, Learning style. State anxiety

Introduction

Cognitive styles are defined as consistent patterns of functioning which are mainly present in perceptual and intellectual activity (Rayner & Riding 1997; Riding, 1997). They establish a qualitative approach to behavior, in contrast to the dominant quantitative approach outlined by aptitudinal dimensions (Messick, 1994). For the moment, the available data on the relationship

of cognitive style with learning strategies are mainly derived from research focusing on other aspects, like academic achievement, cognitive processing, or adaptation of instructional methods and materials. Nevertheless, the findings allow advancement of specific hypotheses. In order to provide an overview of the current state of empirical knowledge, we'll take as references the classifications made by Dansereu (1985), Kirby (1984) and Weinstein and Mayer (1986), given the support they have received and their coherence with the latest models of academic learning. We are not able to specify what the Cognitive Styles Analysis measures, but it does not seem to measure what other instrument designers think of as cognitive style or learning preference. In contrast, Riding and Watts (1997) found that verbalizers (based on the Cognitive Styles Analysis) tended to prefer verbal methods of instruction, whereas visualizers (based on the Cognitive Styles Analysis) tended to prefer pictorial methods of instruction in a classroom learning task. Dewey visualizes how learning transforms the impulses, feelings and desires of concrete experience into higher-order purposeful action. This process "involves observation of surrounding conditions, knowledge of what has happened in the past in similar conditions, and judgement that puts together what has been observed and what is recalled to see what they signify." (Dewey, 1938,). The terms learning style and cognitive style are closely related and are often used interchangeably. Both operate without the individual's awareness and are assumed to be less amenable to change and conscious control. The mental imagery is based on how individuals represent ideas in their minds; in verbal forms of thought or in images or some kind of visual thought processes akin to a kind of mental video. 'cognitive skills development' focuses on aspects such as perceptual modality, e.g. visual, verbal auditory and activity-based modality, (Reinert, 1976). Information storage and retrieval skills involving cognitive complexity and categorization skills, etc. (Letteri, 1980). The more recent work of Keefe and Monk (Keefe and Monk, 1986; and Keefe 1989, 1990) proposes that cognitive style acts as a controlling mechanism in the information processing aspect of learning. On the basis of reviews of the empirical literature, Riding (2001) concluded that one of the major dimensions of cognitive style is the visualizer-verbalizer dimension. Jonassen and Grabowski (1993) reported that the Verbalizer-Visualizer Questionnaire (VVQ) is "the primary instrument used" in research concerning the visualizer-verbalizer dimension (p. 193). However, in reviewing recent research on the visualizer-verbalizer dimension, Plass, Chun, Mayer, and Leutner (1998) concluded that the "the terms *cognitive style* and *learning style* are not used consistently in the literature" (p. 27), and Leutner and Plass (1998) demonstrated some of the shortcomings of the measurement instruments. Although some researchers refer to the visualizer-verbalizer dimension as a cognitive style (Riding, 2001), others refer to the visualizer-verbalizer dimension as a learning preference (Plass et al., 1998), and others have demonstrated that the visualizer-verbalizer dimension is correlated with verbal and spatial ability (Kirby, Moore, & Shofield, 1988). Clearly, there is a need to understand how to conceptualize and measure the key dimensions of cognitive style (Sternberg & Zhang, 2001). Individuals who know and understand their own particular cognitive styles are better able to understand themselves and their unique preferences towards solving problems or confronting issues. In addition, within the learning environment, knowledge of student cognitive style preferences assists educators to better understand their students (Good & Brophy, 1990). Each of us has our own styles of learning and thinking which differentiate us from others. We also have ways of learning and thinking which we share with others raised in the same linguistic and cultural environment relative to ways in which we process and use information. This shared cognitive style differentiates us from those raised in different linguistic and cultural environments. Knowledge of these similarities and differences is crucial in education. While accepting that students will interact with and deal with curricular learning experiences in their own individual manners, curriculum development is often based upon our understanding of the shared elements of the learning process. A variety of teaching and behavior management techniques should be incorporated into the curriculum to further enhance the cognitive development of the students. Recent research suggests that the application of knowledge of

cognitive learning styles should emphasize establishing appropriate strategies to fully use one's potential, whether in the form of teaching strategies for educators or learning strategies for students. Knowledge of one's cognitive learning styles assists in identifying and understanding various teaching and learning strategies employed in the classroom environment. Cognitive learning styles are characteristic ways students and teachers tend to respond to classroom instruction or problem solving situations.

Definitions Ausubel refers to the aspect of 'cognitive style' as the "self-consistent and enduring individual differences in cognitive organization and functioning," (Ausubel 1968, p.170). He also attributes these differences of style to the different human behaviours such as information-storing and processing mechanisms Visual imagery is a flow of thoughts you can see, hear, feel, smell, or taste. An image is an inner representation of your experience or your fantasies -a way your mind codes, stores, and expresses information. Imagery is the currency of dreams and day dreams; memories and reminiscence; plans, projections and possibilities. It is the language of the arts, the emotions, and most important, of the deeper self.

Cognitive Style

Cognitive style is seen as an individual's preferred and habitual approach to organising and representing information (Riding and Rayner, 1998, p11).

Learning style

A Learning Style is the manner in which a learner perceives, interacts with, and responds to the learning environment. It can also be described as the way a person understands or remembers information. Not all people learn the same way and not all teachers teach the same way. It is important for you to know your Learning Style so that you can adapt your study time to your particular style.

- Zarghani (1988) notes that Learning Styles are the cognitive, affective, and psychological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment
- "Visual learners remember best what they see--pictures, diagrams, flow charts, time lines films and demonstrations. Verbal learners get more out of words--written and spoken explanations."
- State anxiety is identified as an unpleasant emotional stimulation that occurs when a person is comes into contact with frightening stressors or dangers.
- The Intuitive (N) side of our brain seeks to understand, interpret, and form OVERALL patterns of all the information that is collected and records these patterns and relationships. It speculates on POSSIBILITIES, including looking into and forecasting the FUTURE. It is imaginative and conceptual

Design of the study

Out of 428 Higher secondary students, 200 Higher Secondary Students were randomly selected and given Cognitive Style Questionnaire and Learning Style Questionnaire. out of which 100 students with visual Learning style and Cognitive I style were chosen for the study and They were also administered with state anxiety by Spielberger and visual Imagery by Marks (1995). 50 were kept in control and 50 in Test groups. Test groups were given with Guided Visual Imagery relaxation for about 4 weeks. Post test scores were collected on visual imagery state anxiety, visual learning style and intuitive cognitive style from control and test group. Quasi experimental design with control group was used for this investigation.

Objectives

- To find out the impact of guided visual imagery relaxation on visual learning style and intuitive cognitive style of the sample
- To inter relate visual learning style with intuitive cognitive style of the students
- To know the impact of guided visual imagery on State Anxiety of the students.
- To differentiate pre and post test scores of visual learning style, intuitive cognitive style and State anxiety .

Research Questions

- Does guided visual imagery alter the scores of visual learning style and intuitive Cognitive style and State anxiety ?
- Does Gender have an impact on visual learning style, intuitive cognitive style and State Anxiety?

Table-1

Differentiation of Visual Learning Style of Pretest and Post test scores of Boys and Girls

Table – 1 Differentiation of Visual Learning Style of Pretest and Post test scores of Boys and Girls					
Psychological variable	Type of Test	Gender	No	Mean	S. D
Visual Learning Style	Pre	Boys	25	3.57	0.37
	Post	Boys	25	7.8****	0.67
	Pre	Girls	25	2.46	0.73
	Post	Girls	25	6.76****	0.53

p* < 0.05, p < 0.01, p*** < 0.001, p**** < 0.0000**

Differentiation of Visual Learning Style of Pre and Post Test scores of Boys and Girls (Figure-A)

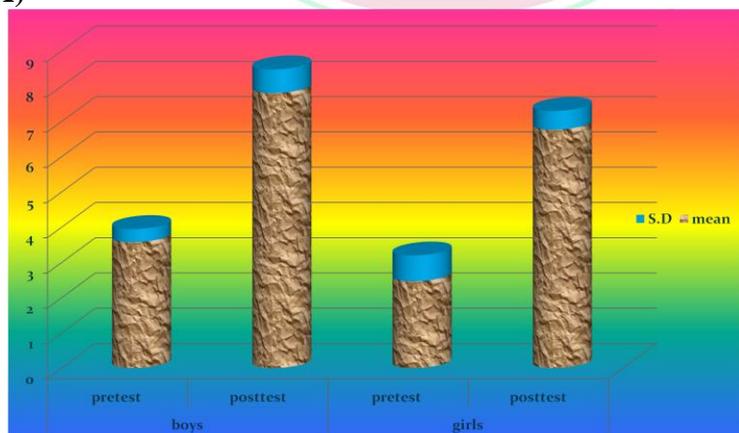


Table-2 Differentiation of I – Cognitive Style of Pre and Post test scores of Boys and Girls

Psychological variable	Type of Test	Gender	No	Mean	S.D
Intuitive Cognitive Style	Pre	Boys	25	66.8	9.23
	Post	Boys	25	78.68***	10.1
	Pre	Girls	25	56.76	11.78
	Post	Girls	25	65.92***	11.2

$p^* < 0.05, p^{**} < 0.01, p^{***} < 0.001, p^{****} < 0.0000$

Differentiation of I – Cognitive Style of Pre test and Post test scores of Boys and Girls (Figure – B)



It is clear from the Table – 1 and figure A, that the calculated “t” values were greater than that of table “t” values, in the case of scores of Boys ($p < 0.001, N=25, t=27.63$) and girls ($p < 0.001, N=25, t=23.83$) for visual learning. Hence it is proved that there were significant differences between pre test and post tests scores of visual learning style in the case of boys and girls. So it has been concluded that guided visual imagery altered the scores of visual learning style.

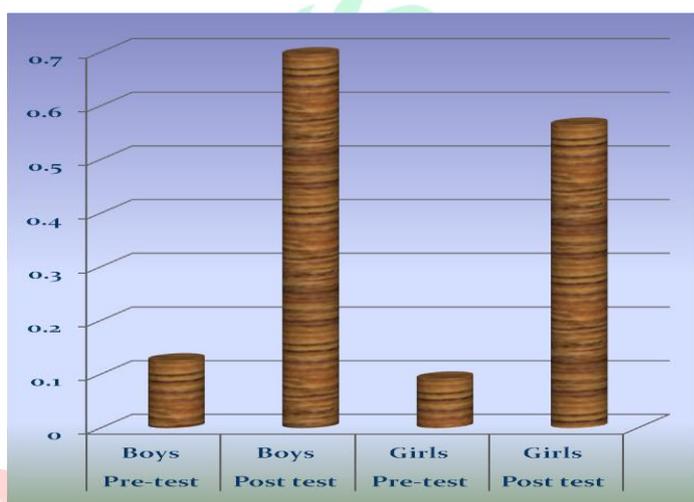
It is clear from the Table – 2 and figure B, that the calculated “t” values were greater than that of table “t” values, in the case of scores of Boys ($p < 0.01, N=25, t=4.34$) and girls ($p < 0.01, N=25, t=2.82$) for Intuitive cognitive style. Hence it is proved that there were significant differences between pre test and post tests scores of Intuitive cognitive style in the case of boys and girls. So it has been concluded that guided visual imagery altered the scores of Intuitive cognitive style.

Table-3 To relate Intuitive Cognitive Style with Visual learning style of

the sample					
Psychological variable	Type of Test	Gender	No	Correlation coefficient	“t” test
Intuitive cognitive style with visual Learning Style	Pre	Boys	25	0.125	0.604
	Post	Boys	25	0.695***	4.64
	Pre	Girls	25	0.091	0.438
	Post	Girls	25	0.564***	3.28

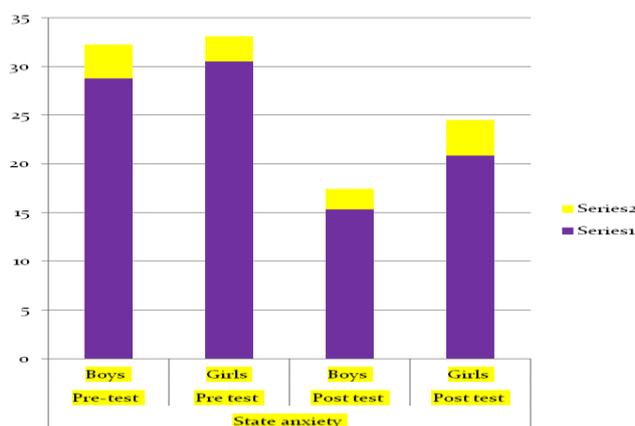
$p^* < 0.05, p^{} < 0.01, p^{***} < 0.001, p^{****} < 0.0000$**

To relate Intuitive Cognitive Style with Visual Learning Style of the sample- figure- C



It is clear from the table 3 and also from the graph C that the calculated “r” values were greater than that of table “r” values, in the case of post test scores of Boys and girls for the Intuitive Cognitive style with visual learning. Hence the hypothesis was rejected and proved that the Intuitive Cognitive style was dependent on visual learning techniques in general and the “r” values for boys were found to be greater than girls.

Differentiation of State Anxiety of Boys and Girls Figure – D)



It is clear from the Table – 4 and figure D, that the calculated “t” values were greater than that of table “t” values, in the case of scores of Boys ($p < 0.05$, $N = 25$, $t = 16.63$) and girls ($p < 0.001$, $N = 25$, $t = 6.21$) for State Anxiety. Hence it is proved that there were significant differences between pre test and post tests scores of State Anxiety in the case of boys and girls. So it has been concluded that guided visual imagery altered the scores of State Anxiety.

higher-order thinking skills need to be developed through effective teaching methods. Whittington, Lopez, Schley, and Fisher (2000) state that teaching at different cognitive levels is important to develop students’ higher thinking skills.

Antonietti (1999) finds that imagery is most useful when dealing with concrete situations and that “the spatial character of visual images makes them directly accessible to intuitive abilities.” He cites the work of Helstrup and Anderson (1996) and Roskos-Ewoldsen, Intons-Peterson, and Anderson (1993), concluding, “transformation and synthesis of mental images can lead to the discovery of emerging meanings that induce insightful ideas. Mental exercise may also result in further reconstruction of inferences or resimulation of events (synthesis). After this stage, learners should search for more information to confirm whether the insights, assumptions, or meanings derived from the mental imagery process are valid to help create new products.”

Results revealed visual imagery ability and motivational arousal imagery to be predictors of cognitive state anxiety. Visual imagery ability also predicted somatic state anxiety.

- Kleinman and Dwyer (1999) examined the effects of specific visual skills in facilitating learning. Their findings indicate that the use of color graphics in instructional modules as opposed to black and white graphics promotes achievement, particularly when learning concepts

Discussion

Guided visual imagery changes the scores of visual learning style, intuitive cognitive style+ and state anxiety. Visual learning style is strongly correlated with intuitive cognitive style. From the present investigation, it has been understood guided visual imagery reduces the state anxiety levels of the sample.

The goal of cognitive learning strategies is to increase student control over the use of strategies, thereby increasing the capacity for learning. When teaching these strategies in the classroom, it is extremely important to remember that both acquisition of and control over the strategy must be learned. The most effective instructional results have been found when the utility of and the rationale for the strategy are taught along with the technique itself. Kurtz and Borkowski

(1984) pointed out that providing students with feedback on the efficacy of the strategy and the long-range value of the strategy improves performance and increases the likelihood of the strategy being transferred to other tasks. Another problem-solving strategy is the coping sequence recommended by Peck, Hughes, Breeding, and Payne (1980). The advantage of this is that it can be used to assist students from different cultural or linguistic backgrounds to deal with academic and nonacademic aspects of the learning situation. In addition, this strategy has been found to be effective in cross-cultural situations. The students are taught to confront the problem substantively and not emotionally, engage and initiate action, conceive of a possible solution, request and use assistance, implement their solution, persist in confronting the problem, attempt alternative solutions if the first does not work, and achieve an outcome. As in the earliest years of life, a second wave of reorganisation of the brain is taking place during the teenage years. Research on adolescent brain development suggests that secondary and tertiary education are probably vital. The brain is still developing during the period: it is thus presumably adaptable, and needs to be moulded and shaped. The practices of induced dreams and dream incubation are other forms of evoking the symbolic potential of the psyche which have been widely utilized. Although the changes are less radical than during childhood, the brain continues to change and develop through adulthood. With increasing age, of course, the brain does become less malleable, and we begin to lose neurons at an increasing rate, although the educational effects of this loss are still not well understood. However, there is also evidence that neurogenesis (the birth of new neurons) continues in at least one part of the brain in adulthood. This is in the hippocampus, an area with an important role in learning and memory. The brain's continuing plasticity suggests that it is well designed for lifelong learning and adaptation to new situations and experiences, and such adaptation can even bring about significant changes in its structure. Active imagination is recommended only for those persons who have been in analysis for a long time and are considered to have a sufficiently strong ego to be able to work on their own. One of Jung's concerns in developing the method was to find a way for persons who had terminated formal analysis to continue their inner work. He would utilize the technique either with persons approaching the end of their analysis, giving it as an assignment to be done prior to an analytic session or suggesting it for persons who were no longer working with an analyst (Weaver, 1964.) The usefulness of the symbolic identification technique (Gerard, 1967), leads us to question Virel's assumption that fruitful work requires being firmly identified with one's own imaginal body. Accelerated learning also embraces other popular brain concepts such as Learning Style Preferences. Here, psychological evidence supports the possibility that individual preferences exist regarding how we like to learn. In education, learners may be allocated to one of three types of learning style (Visual, Auditory or Kinesthetic – VAK). Some believe that presenting material in a way that suits an individual's preferred learning style can improve their learning. (Note that it could also be argued that the reverse might also be helpful, as a remedial intervention to improve processing associated with the other learning styles.) However, there is a considerable scarcity of quality research to support the value of identifying learning styles (Coffield, F. et al., 2004)

Conclusions

1. There was a significant impact of Guided visual imagery on Visual learning style, state anxiety and intuitive cognitive style scores.
2. Visual learning style scores were significantly improved after the training.
3. There was a significant relationship between visual leaning style with intuitive cognitive style.
4. State anxiety of the students have been remarkably reduced among students

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